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ABSTRACT

This publication reports the Student Parent Educator Administrator Children (SPEAC) for Nutrition Program evaluation of the effectiveness of a child care food service personnel training curriculum and a model curriculum package for preschool children. Evaluation of the food service curriculum package was accomplished in part by a pre- and post-test given to program participants and to a group of food service personnel not involved in the program. Evaluation of the preschool curriculum package tested the effective utilization of Child Care Food Program Meals and learning experiences as tools for teaching good nutrition habits to preschool children. Increased acceptance of foods served under the US Department of Agriculture's Child Care Food Program was seen as evidence of improved nutrition habits of preschool children. The acceptance or rejection of these foods was measured operationally by using a Food Acceptability Inventory to count the number of children at each site who either accepted or rejected foods served. The program evaluation sought to reject the null hypothesis that there is no difference in food acceptance between preschool children in the child care programs that participated in the SPEAC program and those that did not. It was possible to reject this hypothesis for three of four food groups, with breads and cereals the exception. Food service workers involved in the training did not show comparable gains in nutrition knowledge. (Author/RH)

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SPEAC FOR NUTRITION

(Student Parent Educator Administrator Children)

Preschool Nutrition Education Project

Evaluation Report

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SPEAC FOR NUTRITION
(Student Parent Educator Administrator Children)
Preschool Nutrition Education Project

Summary

The SPEAC program proposed to develop a model aimed at integrating the USDA Child Care Food Program (CCFP) and the educational curricula and activities of selected child care programs in Minneapolis, Minnesota during the 1979-80 school year.

Through the cooperative efforts of the Minneapolis Public Schools, the Minnesota State Department of Education, the Greater Minneapolis Day Care Association, selected child care and family day care homes, this nutrition education demonstration project was designed to increase nutrition knowledge and change behaviors resulting in improved eating habits by pre-school children.

Among the Project activities were the design, development, field testing and evaluation of a child care food service personnel training curriculum and model curriculum package.

The Project, budgeted at approximately $72,000, employed a full-time project director, a number of curriculum development consultants and writers on a part-time basis and served approximately 400 students, teachers and food service personnel.

The Project was designed to relate to six high schools or parenting programs, twenty child care facilities and two family day care homes. The program emphasis was on serving the nutritional needs of the pre-school population through development of a model which integrates the CCFP into the educational curriculum and activities of child care programs.

Conducted by the Augsburg College Community Research Center, Minneapolis, Minnesota, in collaboration with a graduate student in Nutrition Education, School of Public Health, University of Minnesota, evaluation of the SPEAC pre-school curriculum package sought to test the effective utilization of CCFP meals and learning experiences as a tool for teaching good food habits to pre-school children.

Evaluation of the food service curriculum package was accomplished in part by a pre and post test to measure knowledge and skills present prior to training and knowledge and skills gained after training was completed. Both pre and post tests were administered to groups of food service personnel not involved in the SPEAC program.

The program evaluation sought to reject the null hypothesis that there is no difference in food acceptance among pre-school children in the child care programs which participated in the SPEAC program and those that did not. It was possible to reject this hypothesis in the cases of three of four food groups with breads and cereals the exception. Food service workers involved in the training provided did not evidence comparable gains in nutritional knowledge.

Additional support in nutrition education on a regular basis is seen as a necessary adjunct if curriculum materials are to be kept in place and effectiveness is maintained.

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SPEAC FOR NUTRITION
Preschool Nutrition Education Project
Evaluation Report

PROJECT DESCRIPTION

The SPEAC for Nutrition Program proposed to develop a model aimed at integrating the USDA Child Care Food Program (CCFP) into the educational curricula and activities of selected child care programs in Minneapolis, Minnesota during the school year 1979-80[1]. Through the cooperative efforts of the Minneapolis Public Schools, the Minnesota State Department of Education, the Greater Minneapolis Day Care Association, selected child care centers and family day care homes, this nutrition education demonstration project was developed and tested for possible national adoption or adaption among similar programs.

Included in the concept were health and home economics secondary students,[2] parents of pre-school children, teachers, food service personnel, pre-school children, day care staff and appropriate program administrators.

Among the activities undertaken were the design, development, field testing and evaluation of a child care food service personnel training curriculum and model curriculum package for pre-school children. Emphasis was placed upon: 1) increased understanding and coordination among those involved in the utilization of the Child Care Food Program in the education process, 2) increased opportunities for pre-school children to participate in active learning experiences related to nutrition and the Child Care Food Program (CCFP).

1. This project was funded by Section 18 funds of the USDA. Section 18 monies are a portion of USDA funds which are granted to agencies submitting proposals for nutrition education demonstration projects designed to increase nutrition knowledge and change behaviors resulting in improved eating habits, especially as they relate to USDA funded food programs such as the Child Care Food Program.
2. The high school unit was one part of the overall SPEAC project. This unit was evaluated by the developers of the first draft of the "SPEAC for Nutrition Guide", Patricia M. Copa and Joanne H. Parsons. That evaluation report is contained in a document entitled "SPEAC for Nutrition Student Curriculum", Division of Home Economics Education, Department of Vocational Education, University of Minnesota, St. Paul, Minnesota, June, 1980

Established as part of the expanded National School Lunch Act (P.L. 94-105) in 1975, the CCFP offers federal help to communities to assist in improving the nutritional status of both preschool and school age children. It is available to any licensed public or non-profit private institution providing child care services. (The USDA is responsible for national program administration. At the state level, the Minnesota State Department of Education is in charge of program operations.)

In recognition of the long term consequences of early nutrition on subsequent growth and development, the CCFP makes funds available to child care centers for the provision of nourishing meals and snacks. Food consumption patterns that may determine the quality of the diet in later life are reinforced or intensified during the preschool years. Funding for this project provided additional resources to develop a coordinated model to help preschool children develop good food attitudes and eating habits.

LEGISLATIVE HISTORY OF THE CHILD CARE FOOD PROGRAM

The growth of organized daycare and of federal involvement in child care, plus the publication of data documenting the ill effects of malnutrition on young children underscored the need for new government food programs for preschool children.

In 1968, the National School Lunch Act authorized the formation of the Special Food Service for Children to provide food for daycare programs that served children from areas in which poor economic conditions existed and from areas where there were high concentrations of working mothers.

The 1975 amendments to the National School Lunch Act and the Child Nutrition Act of 1966 divided the Special Food Service Program into two independent programs: the Child Care Food Program and the Summer Food Service Program for Children. The now expanded programs grew out of the simpler and more limited Special Food Service Program which had been targeted for preschool children in poverty areas. Even though the CCFP has been broadened to serve all children on the same basis, the emphasis on serving needy children has been maintained. Thirty-three years after the Congress passed the National School Lunch Act, all preschool children in residential and nonresidential care are eligible to participate in the Child Nutrition Programs.

A program to improve the nutritional status of young children must also educate them to eat, ask for and enjoy foods that meet their needs. Nutrition education is an integral part of the total program. Indeed, the goal of all Child Nutrition Programs is both to provide nutritious food for children and the opportunity to learn enough about food and nutrition to enable them to choose a nutritionally adequate diet throughout life.

Since 1977, USDA has been designated the lead agency in the federal government for nutrition research and coordination of research in other departments. The SPEAC for Nutrition Program is part of USDA's effort to provide formal educational programs for teachers, parents, food service workers and children. The ultimate goal is maintenance of health and prevention of diseases related to nutritional deficiencies or excesses. Funding for projects such as SPEAC is an example of the Department of Agriculture's efforts to respond to the needs for providing nutrition information and dietary guidance.

SPEAC OBJECTIVES

As a response to those needs the SPEAC for Nutrition Program proposed the following principle objective:

> Develop a model which will provide nutrition education and an increased understanding of the role of the Child Care Food Program involving secondary students, parents, educators, administrators, and pre-school children through the cooperation of the Minneapolis Public Schools and existing child care programs[3].

Subordinate objectives of the project included:

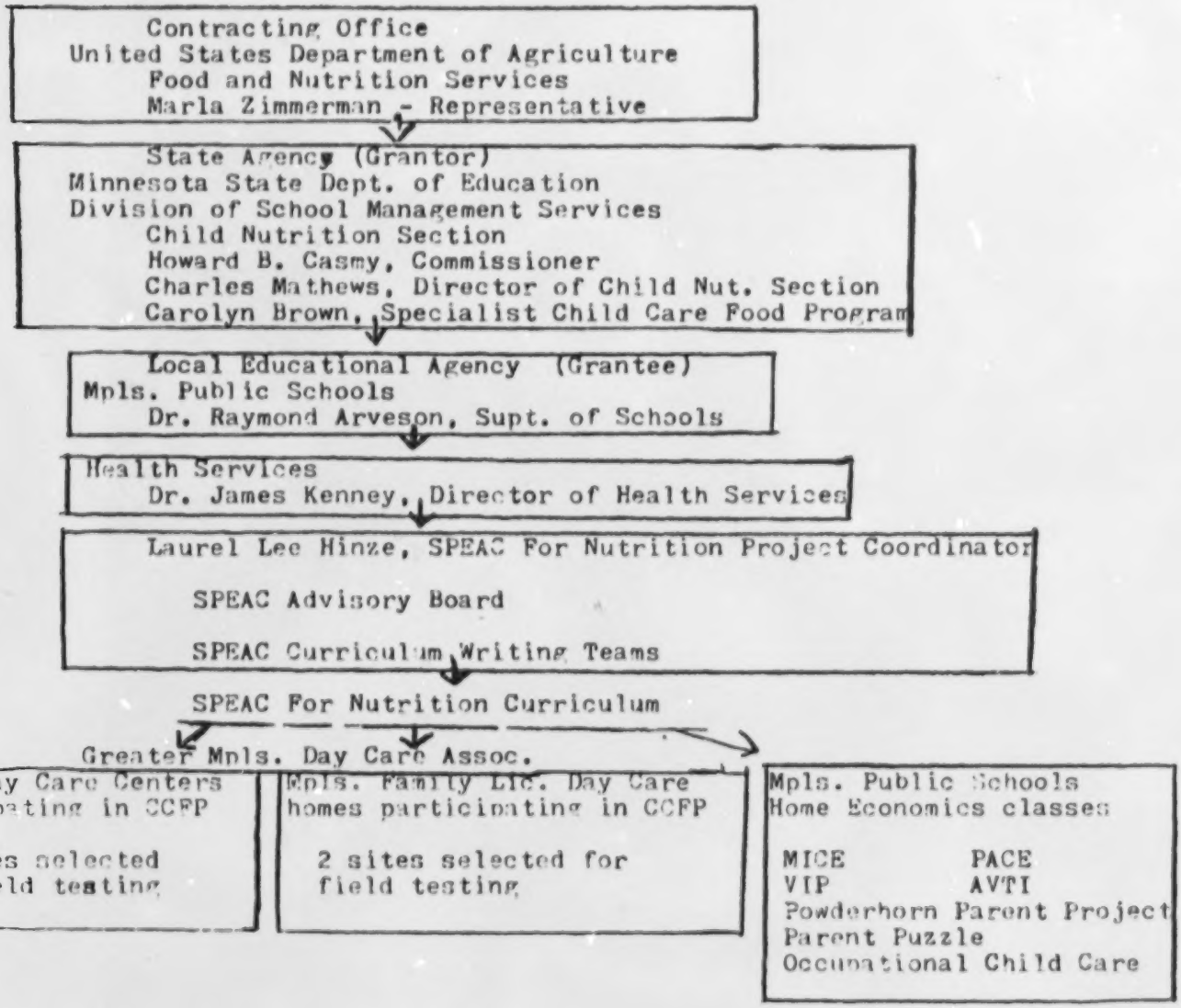
- Improved dietary habits of pre-schoolers through a select educational process involving parents, teachers, day care staff, provider's secondary students and children.
- Increased awareness of parents, teachers, students and food service personnel of their nutritional needs and those of pre-school children.
- Integration of nutrition education into the pre-school curriculum.
- Increased decision making and communication skills between adults, including secondary students and pre-school children.
- Increased ability of adults to meet the nutritional needs of pre-school children and other family members.
- Increased participation in USDA Child Nutrition programs.
- Increased understanding and support for the Child Care Food Program
- Improved cooperation among and between the public schools and the community in providing nutrition education for pre-school children.
- Dissemination of the SPEAC for Nutrition Program concept to other child care facilities in Minnesota following evaluation of the program model.

The Operational Table of Organization for the project is presented on the next page.

3. The Health and Nutrition Policy of the Minneapolis Board of Education provides the educational context linking nutrition education with child care programs: "...parents have the first responsibility for the health education of the child but society must be ready to accept its share of the responsibility. Health education should be designed to strengthen the individual's self awareness and provide students with sufficient information to enable them to make decisions as they participate in family and societal living, in keeping with the values of the community. Nutrition education shall be consistent with and reinforce the goals of education...shall provide inter-disciplinary educational experiences in cooperation with food services for all students serviced by the school system."

Cha

SPEAC Operational Table of Organization
March 1979 - June 30, 1980


Contracting Office
United States Department of Agriculture
Food and Nutrition Services
Marla Zimmerman - Representative
State Agency (Grantor)
Minnesota State Dept. of Education
Division of School Management Services
Child Nutrition Section
Howard B. Casmy, Commissioner
Charles Mathews, Director of Child Nut. Section
Carolyn Brown, Specialist Child Care Food Program
Local Educational Agency (Grantee)
Mpls. Public Schools
Dr. Raymond Arveson, Supt. of Schools
Health Services
Dr. James Kenney, Director of Health Services
Laurel Lee Hinze, SPEAC For Nutrition Project Coordinator
SPEAC Advisory Board
SPEAC Curriculum Writing Teams
SPEAC For Nutrition Curriculum
Greater Mpls. Day Care Assoc.
Mpls. Day Care Centers participating in CCFP
20 Sites selected for field testing
Mpls. Family Lic. Day Care homes participating in CCFP
2 sites selected for field testing
Mpls. Public Schools
Home Economics classes
MICE
VIP
PACE
AVTI
Powderhorn Parent Project
Parent Puzzle
Occupational Child Care

OVERVIEW OF THE SPEAC MODEL

The SPEAC model in its most basic form establishes the relationship between instruction received and curriculum usage by the providers and children's subsequent nutritional performance. This relationship is illustrated in Figure 1.

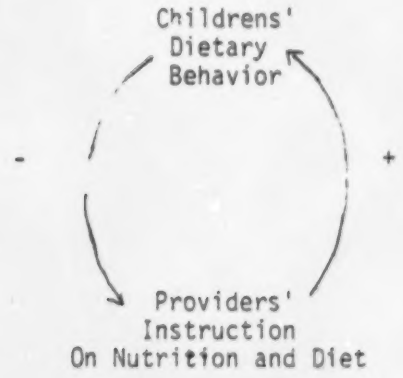


Figure 1. The Basic Relationship

Children's Dietary Behavior is influenced by the foods available in the child care centers, menus provided by food service personnel, providers' instruction in nutrition, parental values and foods served in the home. Improvements in those parameters presumably would result in an improvement in children's dietary adequacy.

A further refinement of the model offers additional insights into the basic relationship. The basic relationship is now augmented with a decision by child care providers to employ the curriculum and instruction, negative influences imposed by child care and other factors influencing the Children's Dietary Behavior. Figure 2 on the following page illustrates such an enlarged model.

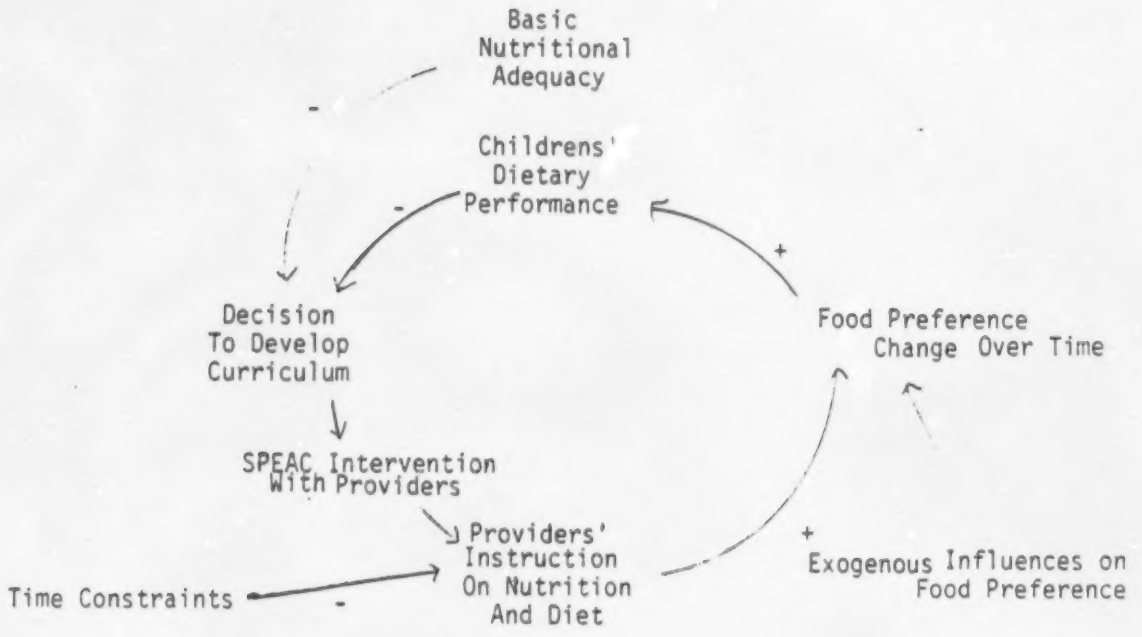


Figure 2. The Enlarged Model

In the Enlarged Model there is greater clarification of the determinate of nutritional instruction. Children's Dietary Behavior in turn should influence the decision to use curriculum based on the amount of help needed by children. This notion of the amount of help needed by children is constrained or limited by the amount of time available via the interface. Child care center providers do not have an unlimited amount of time for nutritional instruction. They are employed for a certain number of hours each week; they have an instructional load of many children and they have additional time consuming duties to perform, viz., record keeping, instruction, meals, etc.

The Enlarged Model also adds the link between nutritional instruction and Childrens' Dietary Behavior called Food Preference Change. Nutritional change is influenced in part by the instruction and curriculum provided teachers and food service personnel; however, there are additional influences affecting nutritional change. These additional influences are exogenous in that they have values that affect, but are themselves unaffected by the factors within the model. Family eating preferences, habits, home food expenditures, and ethnic preferences are examples of exogenous factors influencing nutritional change.

The SPEAC for Nutrition model in its most comprehensive form is the Complete Model illustrated in Figure 3.[4] The model will be discussed in terms of the three subsystems comprising the main components of the SPEAC model: Nutrition Education by Providers, Average Food Preference Change Over Time and Children's Dietary Behavior.

Nutrition Education by Providers is in effect the delivery of the SPEAC curriculum which, of course, is assumed to be influenced positively by the curriculum and the in-service training component of the SPEAC program. Implementation of the Program may be negatively affected by such modifiers as time constraints and the number of children and overall responsibilities for those children with which providers are charged.

The Average Food Preference Change of children over time is one indicator of program effect employed by the project evaluation. Based on changes noted in the children's initial food preference scores at the beginning of the SPEAC program, any changes discernable over time which might be affected through delivery of the program units of instruction, whether it be training provided, the providers or the food service personnel, are also a positive function of the USDA support contributing to menus and menu planning changes. Any changes noted also may be attributed to positive or negative influences external to the Program taken into the account but not assessed by the evaluation.

4. A similar model constructing a mathematical computer simulation was developed as an aid to decision and policy makers in the Expanded Food and Nutrition Education Program (EFNEP), directed by the U.S.D.A., by Richard A. Krueger and reported in his unpublished Ph.D. thesis, "The Development of a Dynamic Simulation Model Used as a Tool in Policy Analysis in the Expanded Food and Nutrition Education Program," Department of Educational Administration, University of Minnesota, June, 1979.

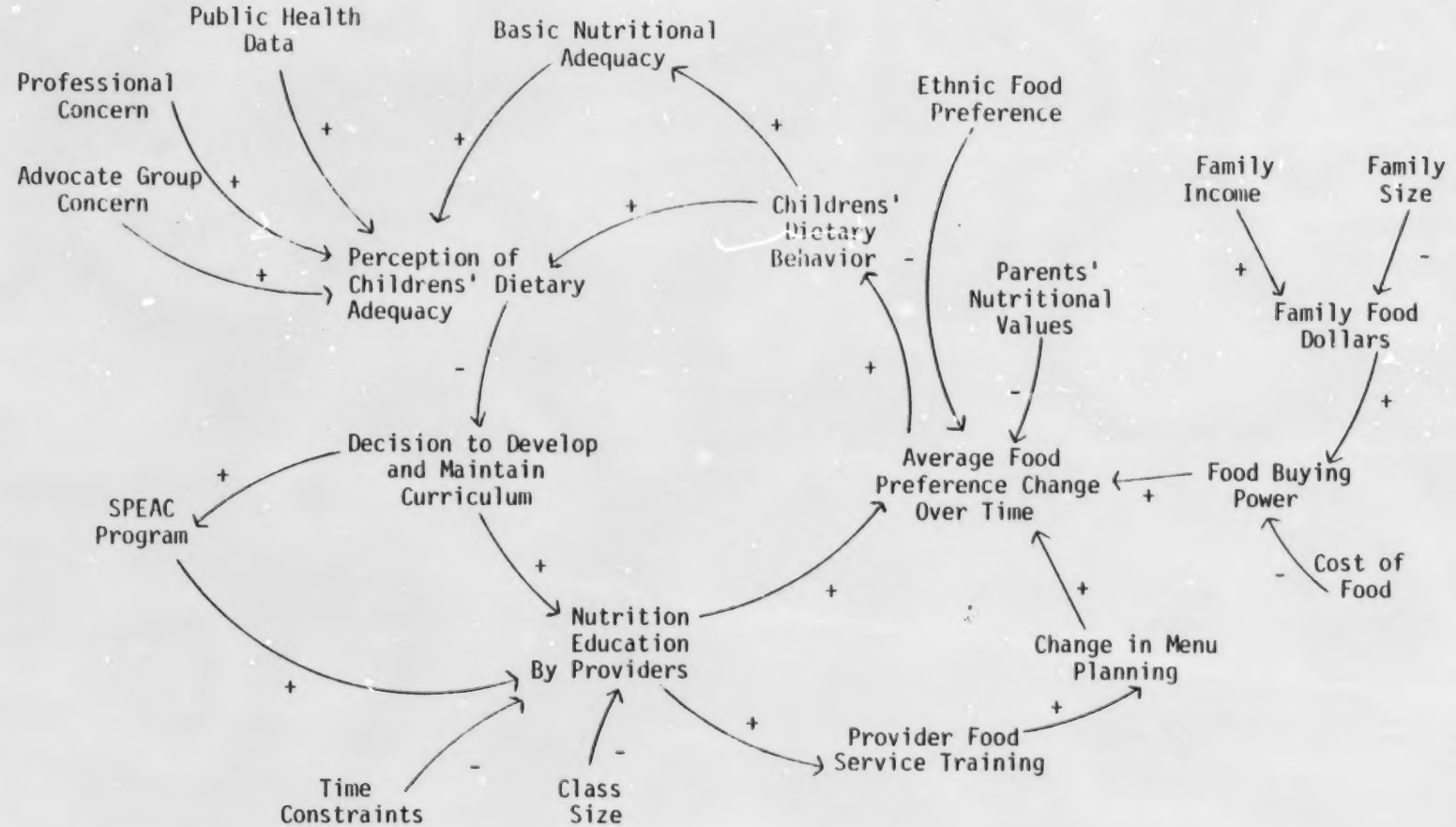


FIGURE 3. Complete Causal Loop Diagram of the SPEAC for Nutrition Program

DESCRIPTION OF THE SPEAC TREATMENT

Teaching staff at the participating daycare centers were selected by center directors to test preschool curriculum units. An in-service training session presented by the SPEAC project coordinator preceded classroom implementation of curriculum materials. Because programs varied with respect to class size, personnel, children's ages, facilities and philosophy, it was expected that teaching methods would not be uniform. Accordingly, the curriculum was designed with maximum flexibility to suit the wide range of needs, but control over methods and procedures was emphasized to the extent possible to maintain evaluation validity.

A three month period of field testing followed the initial curriculum training session. During this period, site visitations by the project cocrdinator were conducted to promote integration of the curriculum into each specific daycare program's regular activities. General observations of the children's involvement, staff assistance and managerial responsibilities were made. If necessary, changes in SPEAC curriculum implementation were suggested.

Few centers had organized nutrition education activites previous to SPEAC. Most teachers were experimenting with the concept for the first time. The individual teacher decided what activities were appropriate for the children and how to incorporate such activities into the program's routine. Accordingly, not all of the units tested were used by all teachers in the same way. All teachers were encouraged to help the children identify and taste a wide variety of foods and to encourage the development of positive eating habits as outcomes of the units chosen for testing.

The units tested were selected by daycare center personnel on the basis of preparation time required for implementation. Additional limitations, such as attentiveness of the children and the relationship of activities to the center's program objectives perhaps influenced the use or lack of curriculum use which contributed to disproportionate use of short or less complex exercises. Because of these factors, the curriculum was used most often as a part of small group activities, science units or as a free table choice.

Activities were chosen from topics including the following:

That's food
What is and isn't food
Food names
Food treasure box
Smelling food
Our growing selves
Healthy snacks for healthy bodies
Milk gives us many foods
Planning a snack
Foods liked
Names and uses of cooking utensils
Cleanliness is a must
Cold and food we eat
Heat and food we eat
Seeing food
Sensing food through sound
Color of food
Food for healthy teeth
The miracle of me
Vegetable-Part of a balanced diet
Fruit-Part of a balanced diet
Bread and cereals-Part of a balanced diet
We eat protein for healthy bodies
Planning a lunch
Get the message
Celebrating with food
I can read a recipe
Changing the shape of things
Where does it come from

In summary, the strength and nature of the treatment experience was not uniform in all centers. Nor was there any complete assurance that all units developed in fact were employed as apart of the treatment. The SPEAC curriculum participant meetings were forums for discussion of problems, observations, and expectations antecedent to revision of the SPEAC preschool curriculum. Children's general reactions, attentiveness, eagerness to participate, or changes in food choices represented the responses of which teachers were asked to become aware. Even though the intensity and content of the treatment varied for each specific group of children, it is reasonable to conclude that at least some parts of the treatment experience were related to any obtained effects and were not due only to the passage of time.

EVALUATION ACTIVITIES

The SPEAC for Nutrition Program proposed to develop a model aimed at integrating the USDA Child Care Food Program (CCFP) into the educational curriculum and activities of selected child care programs through the cooperative efforts of Minneapolis Public Schools, Minnesota State Department of Education, Greater Minneapolis Day Care Association, child care centers, and family daycare homes, nutrition education demonstration project was developed and tested for possible national utilization among similar populations. Among the activities conducted were the design, development, field testing, and evaluation of a child care food service personnel training curriculum and a model curriculum package for preschool children.

Evaluation of the food service curriculum package was accomplished in part by a pre and post test to measure knowledge and skills present before the training and knowledge and skills gained after the training was completed. Both pre and post tests were administered to groups of food service personnel not involved in the program.

Evaluation of the preschool curriculum package sought to test the effective utilization of Child Care Food Program meals and learning experiences as a tool for teaching good food habits to preschool children.

Conceptually, improved nutrition habits of preschool children are defined as increased acceptance of foods served under the USDA Child Care Food Program. The acceptance or rejection of these foods was measured operationally by using a Food Acceptibility Inventory to count the number of children at each site who either accepted or rejected foods served in the Child Care Food Program. The Food Preference Inventory sheets were distributed to selected daycare sites to be recorded by the daycare staff and by the preschoolers' parents. Records were distributed to both the treatment and comparison sites. (See Table 1, page 18.)

The program evaluation sought to reject the null hypothesis that there is no difference in food acceptance among preschool children in the child care programs who participated in the SPEAC for Nutrition program and those that did not.

The independent variable was the SPEAC for Nutrition Program; the dependent variable is the increased number of preschool children accepting foods served under the Child Care Food Program.

EVALUATION PLAN

The SPEAC for Nutrition program was designed to relate to approximately six Minneapolis high schools or parenting programs, twenty child care facilities, and two family day care homes. The program emphasis was on serving the nutritional needs of the pre-school population through development of a model which integrates the Child Care Food Program into the educational curriculum and activities of child care programs.

The evaluation assumed program effects on four groups of persons involved in the project:

1. Pre-school children
2. Their parents
3. Food Service workers
4. Teachers in Child Care Centers

The expected project influences to be assessed included:

1. Eating behaviors and receptivity of new foods by participating pre-school children.
2. Nutritional knowledge of food service personnel gained through a 20-hour training course.
3. General nutritional knowledge of participating parents and teachers.

As specified in the original project proposal, project activities were directed to a city-wide sample of programs selected from the populations of such programs as follows:

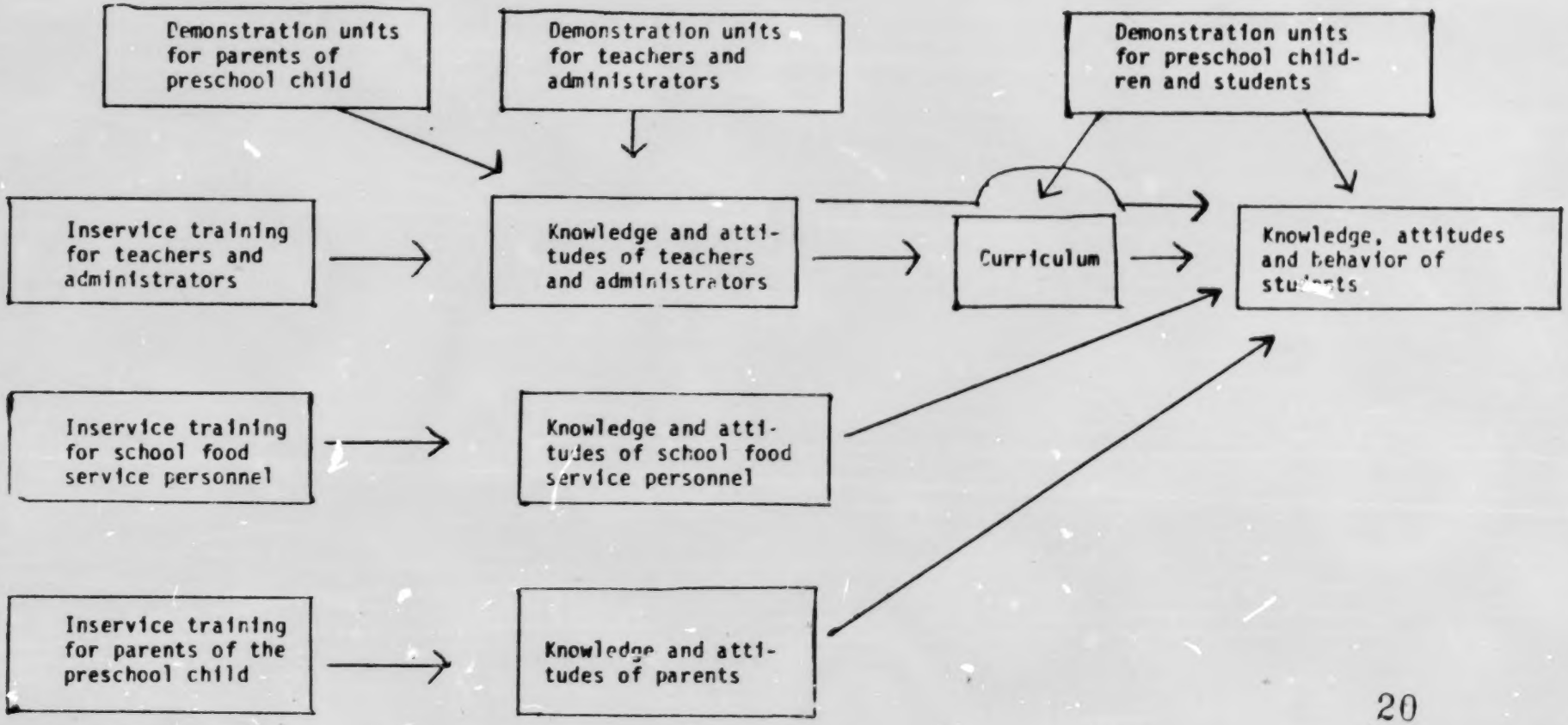
Project Programs	
Group Day Care Centers	20
Minneapolis high school or parenting programs	6
Family Day Care Homes	2

Sample sites were distributed geographically within the city of Minneapolis.

Since this was a new project and project activities were expected to be put into place on differential time schedules, the evaluation sought to be responsive to those schedules as project activities came "on line" and where evaluation findings could be expected to contribute to additive information. This progression is diagrammed in Chart 2.

Chart 2

Evaluation Diagram of SPEAC For Nutrition Demonstration Project


Demonstration units for parents of preschool child
Demonstration units for teachers and administrators
Demonstration units for preschool children and students
Inservice training for teachers and administrators
Knowledge and attitudes of teachers and administrators
Curriculum
Knowledge, attitudes and behavior of students
Inservice training for school food service personnel
Knowledge and attitudes of school food service personnel
Inservice training for parents of the preschool child
Knowledge and attitudes of parents

EVALUATION SEQUENCE

Date	
3/21/79	Development of evaluation instruments to measure outcome objectives for major Project participants. Development of questionnaires to gather participants' reactions to curriculum materials and inservice training.
6/1/79	Selection of field testing sites and comparison sites. A letter was sent requesting involvement to twenty day care centers, two licensed family day care homes and nine Minneapolis public school programs, consisting of: -parent/child interaction programs -occupational Home Economics classes -home based preschool/parenting programs Upon response, a follow-up letter was sent to participants describing the proposed project, time lines and project components. Field test sites were plotted on a map and categorized according to proposed component involvement. Field test sites were divided into sixteen curriculum test sites and two "comparison" sites where the curriculum was not tested. Considerations in site categorization: -program characteristics -proximity to high school child care programs -representation of income levels, ethnic groups, demographic location -willingness to participate in field testing SPEAC materials.
10/1/79-12/31/79	First field testing period for preschool curriculum unit.
10/1/79-12/31/79	Preschool unit evaluation pretest. Preschool food preference records were distributed to field test sites and comparison sites to be recorded by the teaching staff and by the preschooler's parent. "Food acceptibiblity inventory" administered to children by daycare staff.
11/31/79	Pretest evaluation materials collected and compiled.
1/1/80-3/31/80	Second field testing period for preschool curriculum unit.
1/30/80	Food service workshop evaluation. Food service workshop pretests administered to workshop particpants.
2/27/80	Food service workshop post test and written evaluation forms administered to workshop participants. Results compiled to be elaborated upon in final evaluation report.

3/31/80	Preschool unit evaluation post test. Distribution of preschool food preference records. Field test sites and comparison sites to be recorded by teaching staff. Collection of food preference records and compilation of post test results.
7/1/80- 7/15/80	Telephone survey. Telephone survey questionnaire administered to directors, teachers, and family day care providers to solicit opinions of curriculum materials and overall project impact.
7/15/80- 7/30/80	Compilations of pre and post test results from food preference records. Final data analysis, conclusions and written evaluation report submitted to project director by project evaluator.

EVALUATION DESIGN

One method for determining whether a program such as SPEAC has attained its objectives is to compare a group of subjects which has been exposed to the program ("experimental" group), with a similar groups of subjects which has not been exposed to the program ("control" groups). Each group is measured or tested prior to the implementation of the program, and again following completion of the program. The thing which is measured is a behavior or propensity to act that the program is intended to affect. In this case one emphasis of the SPEAC program is to change the food consumption patterns of the children participating in the project. This design is commonly termed the "Classical Experimental Design" and is diagrammed below.

	Prettest		Posttest
Experimental Group	Time 1	program	Time 2
Control Group	Time 1	No program	Time 2

If the two groups are similar to begin with, on the characteristic being measured, and if there is a greater change in the intended direction in the experimental group than in the control group, then one is fairly confident in believing that the change was due to participation in the program.

The treatment sites were chosen randomly from all daycare centers located in low income areas in the city of Minneapolis. Invitations to participate explaining the program were sent to these centers. On the basis of self selection, sixteen daycare centers responded. An attempt to control possible bias in the selection procedure was made by equivalent matching of control and experimental groups based on the appearance of similar demographic factors. All centers were located in low income areas of Minneapolis where family situations are more likely to be similar. Data on family income of children attending each center was provided by the Minnesota State Department of Education-Child Nutrition Section.

A quasi-experimental four-cell design was chosen because of the inability to randomly assign children to treatment and comparison groups.

Oct - Dec 1979 Time I Pretest	SPEAC PROGRAM	Jan - March 1980 Time II Post test
11 experimental		13
2 comparison		2

Design Limitations

1. Experimental groups were not matched by an equivalent number of control groups.
2. Experimental groups were self-selected.
3. Control goups may improve in food acceptance due to sensitization by the pretest. Time and resources did not permit addition of another control grcup that recieves only the post test.
4. A series of post tests to measure the dimensions of attitude and behavior change over time would have been useful to help detect changes due to normal maturation of the children or help provide other sources of explanation for any observed changes.
5. Because geographic location determined the eligibility of participants, drawing inferences about the total population of preschool programs in Minneapolis must be made with reservations.

Testing - Food Preference Record

A master list of 44 foods was chosen from menus submitted to the Child Nutrition Section of the Minnesota State Department of Education. Foods were selected for which pictures were available on food models from the National Dairy Council.

A random sample of ten foods was chosen that could be used by teachers with groups of ten children in about ten minutes. The limited attention span

of preschoolers prohibited the use of the entire master list of food models. The list included one food from the meat group, one dairy food, one fat, two breads, four fruits and vegetables, and one "mixture" dish or entree.

Identity of all ten foods was established before hand; then the teacher recorded the number of children accepting or rejecting each food by counting hands. The exercise was conducted following morning or afternoon "snack time". The instrument was pretested on an independent group of children before being administered to the experimental and control groups.

The entire master list of foods was given to each child's parent and teacher as a cross check for reliability and validity. They were asked to tally to which foods the child had not been exposed, which foods the child rejected, which foods the child tasted, the number of servings each child ate, and which foods the child specifically requested to eat.

Limitations of the Testing Instruments

1. Within the Food Acceptability Inventory, it is not possible to measure the possible peer influence of acceptance or rejection of a food.
2. Only foods that were pictured on food models were included in the master list.
3. Foods in the master list were those that are culturally acceptable to the majority of children and served frequently in daycare centers. No unusual or foreign foods were included or those that are costly or take much preparation time.
4. There is the chance a child may report distaste for foods that cause an allergenic reaction.

Other Limitations and Cautions

1. This project was conducted to gain additional understanding of the influence of nutrition education with preschool children and how to best implement such programming in child care settings. In the process of this undertaking, it was discovered that many child care centers face common barriers to implementing nutrition education which must be surmounted if the effects of intervention are to be optimized. In this respect, this project experienced difficulties similar to other similar undertakings.
2. This project did not attempt to compare one type of treatment with another. In this respect, it differs from other such inquiries in its scope with several components under simultaneous investigation.
3. When multiple "treatments" are supplied to the same subjects, generalizations can proceed only to those subjects which have received comparable treatment. In this case, it is difficult to explain which of the treatments (curricula for preschoolers, parents, food services workers, etc.) provide major or sole effect.

EVALUATION TARGET GROUPS

The approaches to evaluation among the principle project groups were as follows:

Pre-School children

Eating behavior and receptivity to new foods by pre-school children in child care facilities and in family day care centers were assessed prior to the introduction of the program into the centers studied and again at the conclusion of the program year in an effort to ascertain changes in such behaviors and receptivity which might be attributed to the program. Protocols and assessment instruments were developed to assess food intake quality levels and new food receptivities.

Parents and Teachers of Children in child care centers

The nutrition knowledge of adults who exert an influence on children participating in the program was assessed to determine the quality of their nutrition orientation through use of a general questionnaire for that purpose.

Food Service Workers Serving Child Care Centers

Food service workers receiving in-service training for purposes of participation in this project were examined through employment of a nutrition knowledge instrument to assess information gained from in-service training.

FINDINGS

FOOD ACCEPTABILITY INVENTORY

The pre-school children participating in the SPEAC for Nutrition Program were given a Food Acceptability Inventory at the beginning of their participation in the program. The teacher asked the questions verbally, and the students raised their hands to indicate how they felt about particular foods. The inventory consisted of ten (10) foods randomly selected from the longer Food Preference Record. The foods mentioned were American cheese, bacon, tuna, banana, cauliflower, lettuce, pears, whole wheat bread, toast, and beef stew. For each food named, the children were asked to raise their hands if (1) they have ever eaten it; (2) they like to eat it; and, (3) if they do not like to eat it. The results are presented in Table 1 .

Table 1

Food Acceptability Inventory

Food	Like to Eat It		Do Not Like to Eat It		Total Number
	No.	%	No.	%	
American Cheese	262	89.7	30	10.3	292
Bacon	233	88.3	31	11.7	264
Cauliflower	134	57.3	100	43.7	234
Lettuce	217	78.3	60	21.7	277
Tuna	219	79.1	58	20.9	277
Banana	266	89.9	30	10.1	296
Pears	260	94.2	16	5.8	276
Whole Wheat Bread	234	86.0	38	14.0	272
Toast	282	96.9	9	3.1	291
Beef Stew	200	77.8	57	22.2	257

Because of the very high percent of children who stated they like to eat each of the foods (the exception is cauliflower), the Food Acceptability Inventory was not given to the students at the completion of the program. The large percent liking to eat each food meant that there was very little room for improvement or change in the inventory. Also, two of the teachers who administered the inventory indicated that it was too difficult for young children to understand, and that every one of them wanted to raise their hands on each question. One teacher stated "They can't separate what is being asked from wanting to do the action - raise hands". The responses on the Food Acceptability Inventory are of questionable validity.

FOOD PREFERENCE RECORD

Baseline Responses

The Food Preference Record was checked by daycare center children's teachers and parents in both the "experimental" and "comparison" groups at the beginning of the curriculum testing period and by center teachers on children who remained in the centers and could be matched at the conclusion of the curriculum testing period. (Daycare center directors were not willing to make parents' names or telephone numbers available for posttesting purposes.)

The Record was checked for at least some of the 44 foods for 378 children in the experimental sites and for 56 children in the comparison sites. It also was possible to match 138 teachers and parents who recorded children's observed food preferences both at the centers and in the children's homes.

The baseline ratings for all 44 foods for children in all sites is presented in Table 2. The "mean scores" constitute ratings for all children who had been observed by teachers to have had sufficient exposure to the food to warrant a rating. Children who had not been observed responding to a particular food were not rated and, accordingly, not included in the summary. For example, 381 children were rated as to their preference for American cheese. Based on the ordinal points of preference ranging from "1" (Rejects American cheese) to "4" (Requests American cheese), a mean average of 3.25 was calculated, suggesting that the preference for American cheese among all children rated by teachers was about one-fourth of whatever distance lies between "Eats Food" and "Requests Food."

While the "mean scores" help to characterize ratings of food preferences they do not tell us all that might be useful to know about various food preferences. It might be found, for example, that some food preference ratings would have exactly the same "mean scores" and yet the means would have very dissimilar meanings. That is, children's ratings could be greatly dispersed away from the mean rating or very tightly clustered around the mean. The standard deviation from the mean, "S.D." in Table 2, provides a measure of dispersion of ratings around the mean. The range of preference for cottage cheese, then, may be seen as considerably greater than that of American cheese. In fact, ratings of children as to their preferences for cottage cheese constituted nearly the greatest preference range of any of the 44 foods rated with the exception of tomato.

Another measure that closely approximates the truth of the central tendency of a distribution of ratings is the median which often can be derived without calculation since it consists of that measure which divides the group of ratings into halves of exactly equal number.

Table 2

Food Preference Record
Baseline Responses for Foods Across 13 Sites

1 = Rejects Food 2 = Tastes Food 3 = Eats Food 4 = Requests Food

	Mean Score	N	Standard Deviation
Cheese, American	3.25	(381)	.69
Cottage Cheese	2.52	(258)	.97
Milk	3.41	(412)	.68
Bacon	3.32	(300)	.62
Bolonga	3.15	(314)	.65
Chicken	3.20	(407)	.67
Eggs	3.20	(407)	.65
Frankfurter	3.28	(366)	.63
Meat Patty	3.13	(367)	.63
Peanut Butter	3.28	(399)	.74
Fish (fried)	3.03	(366)	.74
Tuna	2.92	(390)	.78
Apple	3.37	(405)	.61
Applesauce	3.21	(411)	.66
Banana	3.33	(413)	.63
Green Beans	2.88	(398)	.77
Broccoli	2.52	(377)	.88
Carrots (cooked)	2.65	(404)	.84
Carrots (raw)	2.90	(396)	.70
Cauliflower	2.40	(301)	.92
Corn	3.11	(404)	.68
Fruit Salad	3.08	(389)	.67
Lettuce	2.78	(380)	.84
Orange (including juice)	3.30	(409)	.64
Peaches	3.18	(398)	.61
Pears	3.24	(385)	.63
Peas	2.75	(401)	.86
Pineapple	3.04	(372)	.70
Potatoes	3.15	(410)	.65
Raisins	3.10	(387)	.73
Tomato (including juice)	2.39	(382)	.98
Baking Powder Biscuits	3.03	(340)	.63
White Bread	3.10	(330)	.65
Whole Wheat Bread	3.12	(402)	.64
Cornbread	2.90	(368)	.72
Dry Cereal	3.23	(398)	.61
Cooked Cereal	3.05	(378)	.80
Pancakes	3.39	(316)	.56
Toast	3.33	(393)	.57
Butter, Margarine	3.16	(404)	.60
Roll, hamb. frankfurter	3.12	(380)	.56
Baked Beans	2.90	(384)	.78
Beef Stew	2.94	(322)	.67
Chili	2.89	(356)	.78

Thus, if we list our mean food preference scores in descending order as in Table 3, we find that the median rating is 3.11 or 3.12 which tends to describe the mean ratings of starchy foods such as breads and corn.

By counting the group of ratings into four quarters as is used to find the median point in the list of food ratings, one locates four "quartiles". The measure standing at the boundary between the first and second quarters, dry cereal, constitutes the first quartile, that between the last two quarters is called the third with the bottom quartile lying below that.

From the distribution of food preference scores by quartiles, then, it is possible to note that the more popular and perhaps more available foods form the upper quartile, while the lower quartile is comprised almost entirely of vegetables and foods usually requiring preparation.

Baseline Food Preferences by Day Care Sites

The Minnesota eligibility standards for free and reduced meals for day care centers are based on three levels of subsidy including "Basic", "Reduced" and "Free" categories, depending on the number of children enrolled whose families, based on income, are of graduated sizes. This method of categorization, applicable to all centers involved in the evaluation, made it possible to assign the equivalent of a socio-economic factor to each center. Accordingly, the numbers of students qualifying for subsidy in each center were combined and taken as a proportion of the total enrollment of each center as of October, 1979. The day care sites and the percent of subsidy received by each are listed in the following chart:

Day Care Site	Percent Subsidy
1. Bryant Glenwood Montessori	100
2. Northside Settlement Day Care	100
3. Joyce Child Care	93
4. Northside Child Development Center	84
5. Grand Avenue Alliance Mission Church	70
6. University of Minnesota Child Care	55
7. First Covenant Day Care Center	44
8. Community Child Care Center	42
9. Building Block Child Care Center	40
10. Como Community Child Care Center	40
11. YWCA Day Care Center	14
Comparison Sites	
12. North Star Day Care Center	100
13. Little People Day Care Center	50

Children's baseline food preferences by day care sites as rated by teachers are listed in Table 4. The table includes the percent of all students rated on each of the 44 foods in the sample and the mean rating and standard deviation (S.D.) of each mean. For example, it can be noted that 88 percent of all children in all

Table 3
Baseline Responses for Food Across 13 Sites
by Quartile

1 = Rejects Food 2 = Tastes Food 3 = Eats Food 4 = Requests Food

Rank	Food	Mean Score	N	Standard Deviation	
1	Milk	3.41	(412)	.68	
2	Pancakes	3.39	(316)	.56	
3	Apple	3.37	(405)	.61	
4	Banana	3.33	(413)	.63	
5	Toast	3.33	(393)	.57	
6	Orange	3.30	(409)	.64	
7	Frankfurter	3.28	(366)	.63	
8	Peanutbutter	3.28	(399)	.74	
10	Cheese (Amer.)	3.25	(381)	.69	
11	Dry Cereal	3.25	(398)	.61	
					2nd Quartile
12	Pears	3.24	(385)	.63	
13	Applesauce	3.21	(411)	.66	
14	Chicken	3.20	(407)	.67	
15	Eggs	3.20	(407)	.65	
16	Peaches	3.18	(398)	.61	
17	Butter (margarine)	3.16	(404)	.60	
18	Bologna	3.15	(314)	.65	
19	Potatoes	3.15	(410)	.65	
20	Meat patty	3.13	(367)	.63	
21	Wholewheat bread	3.12	(402)	.64	
22	Roll	3.12	(380)	.56	
					Median
23	Corn	3.11	(404)	.68	
24	Raisins	3.10	(387)	.73	
25	White bread	3.10	(330)	.65	
26	Fruit salad	3.08	(389)	.67	
27	Cooked cereal	3.05	(378)	.80	
28	Pineapple	3.04	(372)	.70	
29	Fish	3.03	(366)	.74	
30	Baking powder biscuits	3.03	(340)	.63	
31	Cornbread	2.98	(368)	.72	
32	Beef stew	2.94	(322)	.67	
33	Tuna	2.92	(390)	.78	
					3rd Quartile
34	Carrots (raw)	2.90	(396)	.70	
35	Baked beans	2.90	(384)	.78	
36	Chili	2.89	(356)	.78	
37	Green beans	2.88	(398)	.77	
38	Lettuce	2.78	(380)	.84	
39	Peas	2.75	(401)	.86	
40	Carrots (cooked)	2.65	(404)	.84	
41	Cottage cheese	2.52	(258)	.97	
42	Broccoli	2.52	(377)	.88	
43	Cauliflower	2.40	(301)	.92	
44	Tomato	2.39	(382)	.98	
					Bottom Quartile

TABLE 4.

INITIAL MEAN FOOD TEACHER RATINGS OF 434 CHILDREN FOR 44 FOODS
IN 13 CHILD DAY CARE CENTERS IN MINNEAPOLIS, MINNESOTA
FALL, 1979

CHILD CARE CENTERS NO. 1 THROUGH NO. 13

0=NOT EXPOSED TO FOOD 1=REJECTS FOOD 2=TASTES FOOD 3=EATS SERVINGS OF FOOD 4=REQUESTS FOOD

FOOD CHOICES	Percent Rated	1		2		3		4		5		6		7		8		9		10		11		12		13	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Cheese, American	88	3.29	.57	3.00	.85	2.84	.69	3.43	.67	3.10	.28	3.00	0	3.22	.64	3.33	.76	3.13	1.15	3.06	.44	3.42	.52	3.44	.66	3.05	.89
Cottage Cheese	59	2.60	.99	2.60	.99	2.48	.65	2.35	1.05	2.82	.81	2.71	.49	3.22	.67	2.86	.90	2.67	1.10	-	-	2.93	.65	2.45	1.18	1.73	.91
Milk	95	3.66	.55	3.57	.65	3.40	.76	3.57	.67	3.14	.35	3.13	.35	3.56	.51	2.98	.96	3.63	.50	3.38	.50	3.08	.52	3.63	.55	3.19	.75
Bacon	69	3.49	.58	3.40	.83	3.00	.45	3.40	.67	3.11	.32	3.00	0	3.52	.58	2.50	.93	3.44	.51	-	-	3.50	.71	3.26	.56	3.17	.75
Bologna	72	3.33	.64	3.21	.70	2.96	.46	3.28	.69	3.09	.29	3.00	0	2.95	.67	2.40	.97	3.00	.76	2.73	.70	3.00	0	3.41	.56	3.06	.56
Chicken	94	3.53	.60	3.40	.83	3.00	.49	3.41	.64	3.03	.38	3.00	.43	3.28	.53	2.55	.79	3.38	.62	2.88	.34	2.83	.58	3.29	.71	3.48	.51
Eggs	94	3.44	.66	3.00	.93	2.74	.71	3.33	.70	3.03	.29	3.06	.25	3.21	.57	3.00	.59	3.44	.63	3.31	.60	3.00	.60	3.29	.66	3.19	.51
Frankfurter	84	3.50	.61	3.21	.70	3.00	.51	3.38	.70	3.17	.38	3.00	0	3.35	.65	3.14	.56	3.00	1.03	3.25	.45	3.00	0	3.47	.56	3.00	.55
Meat Patty	85	3.49	.66	3.57	.65	3.08	.58	3.14	.61	3.07	.39	2.80	.42	2.84	.55	2.83	.59	3.00	.97	3.06	.25	3.00	0	3.23	.69	3.10	.31
Peanut Butter	92	3.47	.74	2.79	.58	3.08	.39	3.39	.77	3.14	.43	3.54	.66	3.35	.77	3.19	.86	3.27	.88	3.35	.49	2.58	1.08	3.54	.70	2.85	.67
Fish (fried)	84	3.40	.60	2.93	.96	2.85	.54	3.11	.77	2.96	.51	2.67	.58	3.21	.66	3.00	.67	3.00	1.00	2.94	.24	3.00	0	2.59	.86	2.71	.85
Tuna	90	3.38	.62	3.07	.80	2.96	.45	3.03	.85	2.93	.47	2.70	.74	2.93	.60	2.45	.83	3.00	.73	2.77	.44	2.92	.52	2.94	.89	2.38	.92
Apple	93	3.50	.64	3.71	.47	3.08	.39	3.48	.64	3.06	.41	3.19	.40	3.38	.56	3.30	.85	3.69	.48	3.12	.49	3.00	.43	3.54	.56	3.33	.48
Applesauce	95	3.47	.57	3.36	.84	3.04	.34	3.30	.76	3.03	.51	3.00	.37	3.21	.56	3.19	.85	3.19	.66	3.00	.35	2.92	.55	3.28	.77	3.10	.44
Banana	95	3.50	.61	3.43	.65	3.04	.54	3.42	.75	3.14	.35	3.18	.40	3.24	.58	3.24	.65	3.50	.82	3.06	.43	3.00	.43	3.68	.54	3.24	.54
Green Beans	92	2.98	.95	2.50	.94	2.36	.76	3.13	.64	3.03	.45	3.14	.36	2.58	.86	2.79	.80	3.00	.97	2.75	.56	2.75	.71	2.97	.76	2.52	.68
Broccoli	87	2.81	1.00	2.00	1.00	2.26	.87	2.84	.80	2.47	.72	3.15	.69	2.54	.92	1.98	.89	2.63	.89	2.18	.39	3.00	.60	2.27	.83	2.10	.70
Carrots (cooked)	93	2.87	.95	2.64	.75	2.27	.83	2.78	.83	2.63	.73	3.07	.23	2.56	.75	2.61	.71	2.56	1.03	2.35	.49	2.92	.52	2.56	1.02	2.38	.85
Carrots (raw)	91	3.30	.79	2.93	.45	2.69	.74	2.93	.88	3.03	.51	2.50	.76	3.18	.77	2.28	.79	2.94	1.12	3.18	.53	2.67	.78	2.87	.96	2.86	.66
Cauliflower	69	2.89	1.13	2.60	.55	2.17	.72	2.61	.90	2.56	.96	2.23	.44	2.42	.90	1.92	.91	2.27	1.22	2.10	.24	2.64	.67	2.27	.92	2.20	.77
Corn	93	3.46	.76	3.14	.54	2.65	.75	3.24	.62	3.06	.48	3.40	.51	2.89	.52	2.71	.80	2.94	.85	3.24	.56	3.00	.45	3.18	.67	3.15	.49
Fruit Salad	90	3.44	.66	2.79	.70	2.96	.53	3.12	.67	3.11	.32	2.79	.58	3.04	.44	2.74	.82	3.19	.54	3.18	.81	2.83	.58	3.15	.66	3.05	.61
Lettuce	88	3.20	.85	2.71	1.00	2.72	.61	2.96	.76	3.00	.89	2.00	0	2.64	.73	2.12	.92	3.00	.97	2.88	.33	2.36	.92	2.91	.90	2.86	.36
Orange (including juice)	96	3.49	.61	3.29	.83	3.08	.39	3.49	.64	3.08	.28	3.33	.49	3.23	.59	2.80	.78	3.63	.50	3.18	.39	2.73	.79	3.56	.56	3.52	.51
Peaches	92	3.35	.70	3.14	.66	3.04	.59	3.32	.65	3.06	.33	3.07	.27	3.05	.23	3.07	.69	3.31	.60	2.77	.44	2.73	.65	3.36	.66	3.19	.40
Pears	89	3.40	.66	3.14	.54	3.04	.59	3.32	.65	3.09	.29	3.36	.50	3.08	.29	3.18	.68	3.33	.49	3.24	1.03	2.73	.65	3.35	.60	3.24	.70
Peas	92	3.15	.93	2.64	.84	2.39	.75	2.92	.84	2.74	.70	2.87	.64	2.43	.88	2.61	.89	2.94	.85	2.53	.72	2.92	.67	2.59	.93	2.38	.81
Pineapple	86	3.38	.71	3.00	.39	2.82	.62	3.17	.75	3.00	.42	3.07	.27	2.81	.57	2.64	.81	2.88	.96	2.69	.70	2.80	.84	3.15	.74	3.10	.55
Potatoes	94	3.53	.63	2.71	.83	3.00	.40	3.24	.75	3.06	.34	3.06	.25	3.00	.47	3.00	.67	2.75	1.00	3.24	.44	3.00	.43	3.37	.65	2.95	.38
Raisins	89	3.42	.66	2.62	.77	2.54	.65	3.26	.75	3.03	.41	3.08	.29	2.82	.68	3.00	.76	3.25	.58	2.41	1.06	3.00	.43	3.49	.57	3.14	.48
Tomato (including juice)	88	2.21	1.18	1.92	.95	2.52	.90	2.78	.94	2.52	.90	1.93	.48	2.48	.88	2.02	.94	2.27	1.03	2.65	.61	2.46	1.04	2.62	1.07	1.67	.66
Baking Power Biscuits	78	3.33	.73	2.92	.29	3.11	.66	2.99	.71	3.04	.34	2.90	.32	2.71	.76	2.89	.66	2.93	.62	2.82	.39	2.75	.50	3.00	.64	3.15	.37
White Bread	76	3.48	.72	2.92	.49	3.26	.56	3.15	.75	3.09	.29	2.00	0	2.90	.62	2.69	.58	3.00	.60	-	-	3.00	0	3.03	.61	3.05	.22
Whole Wheat Bread	93	3.43	.72	2.90	.57	3.22	.58	3.14	.74	3.00	.41	3.19	.40	3.04	.50	3.06	.49	3.70	.41	3.24	.56	3.58	.52	2.78	.83	2.81	.60
Cornbread	85	3.63	.53	2.77	1.01	2.67	.62	3.17	.62	3.00	.43	2.67	.78	3.00	.71	2.39	.68	3.14	.66	2.82	.64	2.91	.70	2.94	.68	2.70	.57
Dry Cereal	92	3.42	.60	3.00	.41	3.08	.48	3.41	.65	3.15	.37	3.41	.47	3.35	.55	2.78	.67	3.38	.62	3.35	.49	2.75	.62	3.46	.51	3.29	.57
Cooked Cereal	87	3.35	.62	2.46	.82	2.96	.65	3.23	.70	2.85	.68	3.31	.48	2.76	.83	2.69	1.09	2.93	.96	3.29	.47	2.64	.67	3.00	.94	2.95	1.07
Pancakes	73	3.56	.54	3.17	.39	3.15	.44	3.51	.62	3.33	.49	3.10	.32	3.18	.53	2.88	.35	3.44	.63	-	-	3.08	.52	3.51	.51	3.29	.46
Toast	91	3.58	.53	3.25	.45	3.11	.42	3.43	.62	3.04	.44	3.18	.41	3.45	.57	3.05	.61	3.38	.50	3.18	.39	3.25	.45	3.47	.56	3.38	.50
Butter, Margarine	93	3.58	.53	3.00	0	2.96	.34	3.25	.67	3.08	.28	2.93	.27	3.18	.55	2.58	.65	3.50	.52	3.00	.35	3.17	.58	3.26	.56	3.24	.44
Roll, hamb. frankfurter	88	3.55	.54	3.00	0	3.04	.46	3.16	.60	3.06	.24	2.78	.44	3.07	.66	2.87	.57	2.94	.77	3.00	0	3.00	0	3.18	.58	3.10	.30
Baked Beans	88	3.42	.63	3.25	1.10	2.70	.62	3.06	.72	2.94	.59	1.91	.30	2.86	.73	2.72	.73	2.81	.66	3.00	.61	3.00	0	3.00	.69	2.24	.70
Beef Stew	74	3.36	.68	3.36	.92	2.86	.54	2.92	.66	2.82	.75	3.00	0	3.00	0	2.68	.70	2.94	.57	3.06	.25	2.78	.67	2.94	.69	2.82	.39
Chili	82	3.42	.63	2.25	.97	2.80	.58	3.00	.72	2.92	.55	1.00	0	2.78	.67	2.27	.84	2.53	.92	3.19	.40	2.60	.70	3.09	.67	2.48	.81

sites were actually rated as to their preferences for American cheese and that there were some differences in the mean scores of those ratings between the various day care sites. Moreover, there was considerable variation in the standard deviations of those means between sites. That is, the range of ratings of American cheese as a food preference was considerably different among day care sites ranging from "0" in site 6 to "1.15" in site 9.

Three of the food groups-meats, fruits and vegetables and bread and cereals-correlated moderately (r=.25-.28) with the amount of subsidy a center was recieving. That is, as the amount of subsidy increased, preference for foods in those three groups also increased. Such was not the case with the dairy group where there was no significant association with subsidy level.

Teachers' Comparative Baseline Ratings

A statistical comparison of baseline food preference ratings of day care teachers and parents by four food groups is presented in Table 5 where it can be seen, for example, that children's preferences for fruits and vegetables were rated somewhat lower than foods in the other three food groups by teachers of both Project and Comparison group children. Note, too, that ratings of children in the two groups of sites were almost identical. Indeed, there were no statistically significant differences in the ratings of all four food groups in either of the two groups of sites thus attesting to the baseline equivalence of the two groups as to food preferences. ("t" test scores of .05 or smaller would have confirmed a statistically significant difference between Project and Comparison children whereas in all four food groups "t" scores were closer to "1" which would have indicated complete agreement between teachers in the two sets of sites.)

Parents' Comparative Baseline Ratings

A similar pattern can be observed between parents' ratings of their children's food preferences in the Project and Comparison groups, again attesting to the tendency of parents in both groups to rate their children's food preferences similarly. A dissimilarity did appear in the comparison between Project and Comparison group parents' ratings of their children's preference in the fruits and vegetables food group. In that case, the similarities in ratings were substantially weaker. (t=.21)

Teachers' vs. Parents' Ratings

It was possible to match 138 pairs of teachers and parents in both the Project and Comparison groups who had rated food preferences of the same children. In the case of all food groups, parents and teachers rated children significantly differently with the parents rating their children significantly higher than did their

Table 5

Initial Comparative Child Food Response Ratings of Day Care Teachers and Parents by Food Groups

Teachers	Dairy		Meat		Fruits and Vegetables		Bread and Cereals	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Project Children (N=353)	3.13	(.56)	3.15	(.49)	2.97	(.48)	3.14	(.47)
Comparison Children (N=56)	3.14	(.69)	3.13	(.38)	2.99	(.35)	3.13	(.32)
	t=.94		t=.74		t=.82		t=.90	
Parents								
Project Children (N=126)	3.30	(.51)	3.19	(.39)	3.01	(.45)	3.21	(.39)
Comparison Children (N=13)	3.22	(.58)	3.17	(.36)	3.16	(.35)	3.17	(.41)
	t=.61		t=.84		t=.21		t=.76	
Teachers-Parents in all Sites (Project + Comparison)								
Teachers (138 pairs)	3.15	(.56)	3.07	(.43)	2.88	(.40)	3.08	(.40)
Parents	3.29	(.52)	3.19	(.38)	3.03	(.42)	3.23	(.40)
	t=.02		t=.005		t=.000		t=.004	

teachers. These discrepancies may be explained in part by the greater part of the child's life over which the parent has the opportunity to observe (and control) food consumption and the less varied menu which may have characterized the day care centers than may have been available in the children's homes.

In terms of the overall validity of parents' ratings of their children's actual food consumption, reference is made to a study in which fourteen suburban Boston families with preschool children attending the same daycare/nursery center were studied to in part determine the relationship between parental perception of the preschool child's food preferences and the child's actual food consumption. Eleven of the 14 mother-child pairs achieved a congruency score of 75 percent or better, suggesting that the mother often does know which foods her child prefers.[5]

5. Glovsky, Ellen R., "Food Preferences of Preschool Children," School of Allied Health Professions of Sargent College, Boston University, 1977, Masters theses abstracted in Journal of Nutrition Education, October-December 1978, Volume 10, Number 4, page 151.

FOOD PREFERENCES PRE-POST

For the purpose of assessing any changes in childrens' food preferences over the course of the curriculum testing period, day care site directors and teachers were asked at the conclusion of the period to again respond to the Food Preference Record on behalf of their enrolled children. Among the Project (treatment) groups 139 of the original 278 children were still enrolled or were otherwise available for posttesting. Food Preference Record reports were received on an additional 61 children who had been enrolled in the Project sites over the course of the curriculum testing. Of 56 original Comparison group children it was possible to retrieve posttest food preference ratings on 29. These comparisons are presented in Figure 4.

Figure 4
Administration of pre-post Food Preference Record

	Number of Children	
Group	Pretest	Posttest
Project	278	139(+61)
Comparison	56	29

To test whether or not the differences between the food preference means in the groupings in Table 6 were statistically significant over the duration of the curriculum testing, thus suggesting some project influence on participating childrens' food preferences, the "t" statistic (Student's t) and probability levels were computed. Two types of tests were performed:

1. Independent samples--cases were classified into two groups (Project and Comparison) and a test of mean differences on the Food Preference Record ratings for the 44 foods combined into the four food groups was performed.

2. Paired samples--for paired observations a test of treatment effects was performed. That is, comparisons were made where it was possible to obtain food preference ratings for the same children both before and after participation in the project. (This is sometimes called a correlated t-test.)

The basic problem, then, was to determine whether or not any observed differences between means implies a true difference. Since it is highly probable that two groups of children would be different due to their natural variability, it is clear that any differences in food preference means doen not necessarily imply that they actually differ as to food preferences. It was for that reason that care was taken

to establish the initial equivalence of the Project and Comparison groups as to food preference ratings as reported in Table 5.

The goal of the statistical analysis, then, was to establish whether or not a difference between the two groups and pairs of children after exposure to the curriculum treatment was significant. "Significant" here does not mean "important" or necessarily "consequence", but rather "indicative of" or "signifying" true differences between groups.

With these tests of statistical significance we learn the probability that any observed differences in means could have occurred by chance, or that something was operating,such as Project influence, that would have contributed to any observed differences. It is a convention to accept as statistically significant associations which have a probability of occurring by chance 5 percent of the time (.05) or less. Tests of statistical significance only indicate the likelihood that an observed association actually exists; they do not indicate the strength of such relationships.

It was established that the two groups are similar to begin with on the attribute being measured. (See Table 5.) In Table 6 it can be seen that the mean scores for the Comparison and Project groups are <u>similar</u> on the pretest. The Comparison group mean scores are slightly higher than the scores of the Project group on each of the four food categories, but these differences are not statistically significant at the .10 level. On the posttest, however, the mean scores for the Project group are higher than those of the Comparison group on each of the four food categories, and these differences are all statistically significant beyond the .05 level.

To assess whether these changes were due to the program, the pretest means and posttest means for the Project and Comparison groups are compared in Table 6B Since a number of children in both the Project and Comparison groups were not included in <u>both</u> the pretest and posttest, the comparisons in Table 6 are based only on those persons who were included in both the pretest and posttest. The mean scores for the Comparison groups show a decrease between the pretest and posttest on all four food categories. Two of these decreases are statistically significant beyond the .10 level (meat, and fruits and vegetables). In the experimental group, however, the mean scores increase in all four food categories. Two of these increases are statistically significant beyond the .05 level (fruit and vegetables, and dairy products), one is statistically significant beyond the .10 level (meat), and one is not statistically significant (breads and cereals).

It appears that the SPEAC program did have a major effect in the acceptance of fruits and vegetables and dairy products, a lesser effect in the acceptance of meat, and little or no effect in the acceptance of breads and cereals.

Table 6

A. Comparison Between Control Group and Experimental Group Means for Pretests and Posttests.

Food Category	Test	Project Group N	Project Group Mean	Comparison Group N	Comparison Group Mean	Difference in Means*	t	Probability
Dairy	Pre	275	3.10	56	3.14	-.04	-.33	.743
	Post	137	3.19	29	2.91	+.28	+3.29	.002
Meat	Pre	276	3.10	56	3.13	-.03	-.57	.569
	Post	138	3.13	29	2.93	+.20	+3.12	.000
Fruit & Vegetables	Pre	277	2.90	56	2.98	-.08	-1.50	.137
	Post	138	2.98	29	2.78	+.20	+3.60	.000
Bread	Pre	276	3.10	56	3.13	-.03	-.77	.442
	Post	138	3.08	29	2.94	+.14	+2.22	.028

*Project $\bar{x}$ - Comparison $\bar{x}$

B. Comparisons Between Pretest and Posttest Means For Comparison Groups and Project Groups.

Food Category	Group	N	Pretest Mean	Posttest Mean	Difference in Means*	t	Probability
Dairy	Comparison	29	3.03	2.91	-.12	-.87	.393
	Project	136	3.09	3.21	+.12	+2.17	.031
Meat	Comparison	29	3.07	2.93	-.14	-1.91	.066
	Project	136	3.07	3.14	+.07	+1.76	.080
Fruit & Vegetables	Comparison	29	2.87	2.78	-.09	-1.36	.184
	Project	136	2.84	2.98	+.14	3.80	.000
Bread	Comparison	29	3.06	2.94	-.12	-1.91	.067
	Project	136	3.05	3.08	+.03	.62	.537

*Posttest $\bar{x}$ - Pretest $\bar{x}$

Telephone Survey of Child Care Centers

To further assess the acceptance and effects of the SPEAC program respondents in a telephone survey were asked to evaluate the usefulness of the curriculum materials. Their views are summarized in Table 7.

Table 7.

Usefulness of Curriculum Materials

Response	N
Very Useful	2
Useful	8
Not at all Useful	0
	N = 10

A strong majority (8 of 10) believed that the curriculum materials were "useful"; the remainder indicated that they were "very useful".

Those who felt that the curriculum materials were very useful offered the following reasons:

> "We had run out of ideas and projects. It gave us a broader range to pick from to do projects with the children. Family day care was limited in this way before we had this curriculum."
>
> "It was set up so it was easy to use and put together in a handy way. The activities were usually appropriate, although it depended upon the age group of the children."

Those who stated that the materials were useful commented:

> "It helped the children understand nutrition in an enjoyable way."
>
> "It gave the basis of something to follow."
>
> "It gave the staff lots of new ideas, but many of the projects were too time consuming for the teachers to use."
>
> "We wouldn't have done a nutrition program on our own."

The Respondents were asked what parts of the nutrition education curriculum worked best for them.

> "The lessons that actively involved the children were popular."
>
> "The activities where the children had something to do rather than listen; any of the games were good."
>
> "The lessons where the children could actually handle and touch food were the best ones."

"The food lessons where the children actually worked with food were the best."

The fruit and vegetable units seemed to work well:

"The vegetables and fruit sections and matching were good. Some snack ideas were great. It took three hours to go through magazines for pictures but the children enjoyed it."

"The differences between fruits and vegetables and dairy products... the pictures were useful for play."

Other Respondents commented:

"Bread baking was the best. I have little ones so the basics were more beneficial than preparing or organizing a meal. At the youngest ages just recognizing foods is an important task."

"The extra activities seemed easiest to work with."

"I was happiest with the progress and involvement of the kitchen staff. I was less happy with the teachers."

When Respondents were asked to describe what parts of the nutrition education curriculum gave them the most difficulty in general, they stated that the curriculum was too complicated, too structural, materials too expensive to acquire:

"Some of the lessons seemed really long. The childrens' attention spans were not there. I couldn't do justice to the longer lessons."

"Some of the lessons were too far above pre-school age groups. The instructions and steps took too long, and at that rate we never made it to the projects. The materials need to be simplified for pre-school use."

"We had difficulty with anything that required lots of preparation, and anything that required listening rather than doing."

"The ones which required talking; the children were too young to respond well."

"Mr. Bunny and Mr. Tooth were not useful. It was difficult to put together things and run off things. Some of it was too structured for this age group."

"The youngest children (2½ year olds) didn't have enough to do or couldn't understand the lessons that were provided."

"All the materials that were needed to do a lessons were not always on hand or easy to get."

"Some of the suggestions and material were too expensive (we had to substitute when out of season vegetables were used)."

The number of participants who believed they were given enough assistance and information to use the materials effectively was high: all but one was satisfied with the availability of program assistance. Only one program wanted more assistance with pre-nutrition education curriculum materials.

Most of the programs were satisfied with the information and resources provided. A few wished for:

- more art projects
- more stores
- more pictures and posters appropriate for pre-school children
- some of the books were "too old"
- a packet of materials to go along with the curriculum

Some felt that it was too difficult to free up staff to get to the in-service sessions. They would have liked"(1) more consultation, more assistance at the Center after each lesson; (2) someone actually coming into the Center to observe and help out; (3) more overall coordination of the work that each Center was doing: tne overall goal of the project was too large to be coordinated successfully."

Respondents were asked to describe the extent to which the curriculum fit into the Center's regular activities. Their views are summarized in Table 8.

Table 8.

Response	N
To a Great Extent	1
To Some Extent	9
Not at All	0
	N = 10

Nearly all of the respondents fe,t that the curriculum materials fit into the regular activities of the Center "to some extent". Only one center (Family Day Care Home) believed that the nutrition education materials fit in to a "great extent". None of the Centers checked the curriculum as "useless".

For some, time was an obstacle:

"The materials were too long and involved. They could have been shorter. We felt pressured by the time schedule."

"For some lessons there was no way we could have time to set it all up. In day care, we do things in a real quick fashion. We just couldn't get it all done in time."

"Mostly the lessons were pretty self-explanatory but too time consuming to prepare."

"We fit it into our activities but it took a big chunk of time. The program was very long."

"There were too many activities for us to complete in a lesson."

For some, staff use of the materials was a problem:

"There was a lack of planning on the staff's part."

"Things were done out of sequence."

"The staff was not consistent in the use of the materials and was discouraged because the materials were too easy, too."

For other programs, the lessons were unsuitable for the childrens' level of comprehension:

"The children were young (2½ - 3 years old) so we had to revise them to make the easier to understand."

"A lot of lessons could have been combined.They seemed way too basic."

"We are a center with a self-directed, individual approach. We need more self-contained activities with progressive levels of difficulty."

"We use "units" in day care. We fit in the lessons where we could. There was such a concentrated focus in the curriculum, but we tried to intersperse the lessons where they would work well in a unit."

A Family Day Care Provider enthusiastically commented:

"It would help to have more Family Day Care Providers aware of the curriculum and to be able to use it in their homes."

Respondents were asked to rate the extent of change in the childrens' food choices at meal or snack time as a possible consequence of the SPEAC project. Their answers are tabulated Table 9.

TABLE 9.

Extent of change in Children's Food Choices at Meal or Snack Time

Response	#
To a great extent	1
To some extent	4
No change	5
	N = 10

Half of the respondents noted no changes in the childrens' eating habits. The following reasons were given:

"It will take alot more than this program to make an impact. The children are very much used to a certain type of food. It takes a long time to change habits and we've been working on it since I've been here. I'd like to know how to do it. Just trying to get children to eat good food compared with what they get at home is very difficult."

"Our diets are particular and there is already a focus on good food choices.

Four of the respondents noted changes in childrens' food choices to some extent. Their observances were:

"There was more talk about nutrition at meal times, but they weren't really eating better."

"They now know the difference between good and bad food."

"No changes, but they talked a good line."

Participants in the SPEAC testing were asked if there were any menu changes as a result of the project. Their responses are shown in Table 10.

Table 10.

Menu Changes Following the SPEAC Program

Response	N
Yes	4
No	6
Don't Know	0
	10

Those who noted a positive change in menus (4 of 10 respondents) replied:

"SPEAC and the CCFP made me more aware of what I was serving."

"The cook did a good job. There was more variety in the menu."

"The inservice for the kitchen staff was excellent. The Head Cook was very responsive and enjoyed the new ideas, especially the fry bread and the shakes. It was alot of extra work for me but I could do it again if I organized myself."

"Yes, Our cooks had been to the SPEAC inservices and so they incorporated what they learned into the menus.

From those who noted no menu changes as a result of the SPEAC project, the following reasons were given:

"There was already a focus on food in our center. We don't use sugar, white flour or serve cookies. The children had already been exposed to lots of non-meat products before SPEAC and the children have constantly been improving."

Survey results showed limited parent participation in the SPEAC project preschool unit. When respondents were asked in what ways parents participated in their centers, the following replies were given:

"The parents returned the questionnaires and that's it."

"None at all. We tried a workshop and a speaker, but there was no turnout. They did fill out the (food preference) questionnaires."

"We sent menus home to the parents, but as a rule no attention is paid to them. Overall, there is a lack of interest. We have a population of single parents who are too tired at the end of the day to show much interest, and they also have confidence in the school's ability to serve good food."

"The only parent involvement was in filling out the food forms."

"None at all. They only received materials concerning the program."

"Only by filling out the food preference forms."

"A little bit. A fruit salad for morning snack was made and the parents were invited. Otherwise, not a lot."

"None, except the survey questionaire in the beginning."

"Our's didn't. Only in the beginning and in the end when we sent home the questionaires."

"We had a pot luck in which Laurel was invited to give a presentation to the parents."

Respondents were asked about their overall satisfaction with the project. Their responses are categorized in Table 11.

Table 11

Overall Satisfaction with the SPEAC Project

Response	N
Very satisfied	3
Satisfied	5
Unsatisfied	2
	10

One center that was satisfied with the SPEAC project commented:

"We were very pleased that the effort is being made to work with early childhood programs. It's a good beginning."

Those who were less satisfied offered these ideas:

"Perhaps a more coordinated effort is needed. Wasn't there supposed to be a parent newsletter going out? We were really looking forward to something like that."

"No changes occurred because we were very nutrition minded in the first place."

"No changes - The menu was already good."

"No changes because we were already involved in serving good food and a good diet. So much depends upon the cook in a given center. Food is a touchy issue. Our menus were already excellent."

"No change. Before the program started we had well-balanced meals."

"The staff didn't feel like using the curriculum and they couldn't get to all the meetings. Also one staff member left in the middle of the project and was replaced by another who hadn't been trained.....The Staff felt the workshops were a waste of time and wouldn't go back."

Respondents were asked if they would participate if the SPEAC project was made available again. Their replies are found in Table 12.

Table 12.

Number of centers willing to participate in SPEAC if offered again

Response	N
Yes	5
No	3
Don't Know	2
	N = 10

Those willing to participate again, half of the respondents, would do so with some reservation:

"Overall, it was a good idea but I'd like to have another staff member do it this time. Giving money as an incentive to participate was a good idea. Otherwise, it was tiring."

"Yes, but I'd get committment from the staff people instead of just the director deciding to do it."

"Yes, but only if it was alot shorter."

"Yes, but not in the same way."

"I don't know how committed my teachers would be to try it again. There was too much paperwork for them. I'd like to see at least one classroom involved because it is important to keep testing the curriculum."

Those who would'nt participate again said:

"No, I wouldn't participate again, but it would be good for others to do it"

"It was a big task and a hassle, to get all the things done that we had to do."

Respondents were asked if anything occurred as a result of the project that they didn't anticipate.

The responses follow in Table 13.

Table 13.

Unanticipated results of the SPEAC program.

Response	N
Yes	4
No	6
Don't Know	0
	N = 10

Some of the unanticipated results suggested follow:

"The food habits of my own child have improved and it made me more aware of what are good foods." (Family Day Care Provider)

" I was surprised that the children did become aware of different things and did make comments about what's good to eat."

"They cameand took pictures of the children."

I was surprised at the change in eating habits."

Program participants were asked to make suggestions for improving SPEAC for nutrition project. Curriculum simplification and length of preparation time for the activities, parent involvement, and inservice sessions were among those mentioned:

"Some of the activities were super but because the children are only under three, we need more activities for the younger ones."

"Simplify the lessons more for the younger ones."

"Think about making more activities simpler for the younger children."

"It was too long and there was too much to test. It's not natural for preschool because we have so much to do other than nutrition education. It could be brought in bit by bit."

"Most of the material was the same old thing. We're looking for new information. Some of the materials were too simple for our children. The curriculum wasn't easy to use in sequence. It would be better if we were able to pick and choose. Most of the materials were below where our children were."

"Try not to have it so lenghty. Try to make the lesson packages more complete with resources provided. There was too much preparation necessary to do the lessons. We just don't have that kind of time in day care."

"We need more learning games and art activities - things to do. Provide lessons with as little preparation as possible. The teachers had to much to do."

"Have someone come in to do some demonstrations and work with the teachers individually. We need a special consultant in nutrition to work with our type of program."

"The parents need nutrition education more than the children. The sweet treats they bring in are so discouraging."

"Some of the meetings (inservice sessions) weren't as effective as they could have been. It wasn't worth the effort to get to the meetings. Our time is real valuable, and we'd like to feel that it wasn't a waste of time. Try to make the meetings more involved and cover more information."

The respondents were asked what parts of the nutrition education curriculum worked best for them.

The lessons that actively involved the children were popular:

"The activities where the children had something to do rather than listen; any of the games were good."

"The lessons where the children could actually handle and touch food were the best ones."

"The food lessons where the children actually worked with food were the best."

The fruit and vegetable units seemed to work well:

"The vegetable and fruit sections and matching lotto (game) was good. Some snack ideas were great. It took three hours to go through magazines for pictures but the children enjoyed it."

"The differences between fruits and vegetables and dairy products...the pictures were useful for play."

Other respondents commented:

"Bread baking was the best. I have little ones so the basics were more beneficial than preparing or organizing a meal. At the youngest ages, just recognizing foods is an important task."

"The extra activities seemed easiest to work with."

"I was happiest with the progress and involvement of the kitchen staff. I was less happy with the teachers."

When respondents were asked to describe what parts of the nutrition education curriculum gave them the most difficulty in general, they stated that some of the curriculum was too complicated, too structured, or materials too expensive to acquire:

"Some of the lessons seemed really long, the childrens' attention spans were not there. I couldn't do justice to the longer lessons."

"Some of the lessons were too far above preschool age groups. The instructors and steps took too long, and at that rate we never made it to the projects. The materials need to be simplified for preschool use."

"We had difficulty with anything that required lots of preparation, and anything that required listening rather than doing."

"The ones which required talking; the children were too young to respond well."

"Mr. Bunny and Mr. Tooth were not useful. It was difficult to put together things and run off things. Some of it was too structured for this age group."

"The youngest children (2½ year olds) didn't have enough to do or couldn't understand the lessons that were provided."

"All the materials that were needed to do a lesson weren't always on hand or easy to get."

"Some of the suggestions and materials were too expensive (we had to substitute when out of season vegetables were used)."

The number of participants who believed they were given enough assistance and information to use tne materials effectively was high:

All but one was satisfied with the availability of program assistance. Only one program wanted more assistance with the nutrition education curriculum materials.

Most of the programs were satisfied with the information and resources provided. A few wished for:

-more art projects

-more stories

-more pictures and posters appropriate for preschool children; some of the books were "too old".

-a packet of materials to go along with the curriculum.

Some felt that it was too difficult to free up staff to get to the inservice sessions. They would have liked :

1. "More consultation, more assistance at the center after each lesson.

2. "Someone actually coming into the center to observe and help out."

3. "More overall coordination of the work that each center was doing: The overall good of the project was too large to be coordinated successfully."

Summary

Although only half of the respondents expressed overall satisfaction with the project, and a desire to participate again, 8 of the 10 found the curriculum materials useful and 9 were pleased with the information and assistance available to them throughout the project. Much of the dissatisfaction appeared to be due to concentrated effort necessary to meet curriculum testing deadlines, an unavoidable negative unrelated to the worth of the SPEAC program per se.

Curriculum effectiveness was limited by lessons that were too complicated or complex for preschool children to comprehend, and that required too much preparation time by the teachers. In many cases, materials were too expensive or difficult to acquire, which led to staff frustration and improvisation.

Of the 5 who reported no change in eating habits, most were realistic about the time necessary to make consistent observations of behavior change in children and were highly encouraged by the childrens' increased awareness of foods and willingness to taste new foods.

While 4 noted greater variety in menus, 6 believed that no menu changes occurred as a result of the SPEAC Program. However, all of the negative responses were qualified by the previous history of serving good food and well-balanced meals in those centers. The SPEAC for Nutrition Program should be credited with reinforcing those positive behaviors and probably is responsible for the changes that did occur in the menus.

By almost unanimous agreement, parent participation was the weakest component, but this is consistent with the general lack of parental interest in day care programs.

It was commonly agreed that the SPEAC program had value and fundamental worth as a concept for nutrition education, but the respondents also encountered the curriculum as a time-consuming, additional activity to carry by an over burdened staff.

It appears that the future success of SPEAC for nutrition depends upon a change in the form of training and assistance given to the teachers who will implement the curriculum. Fewer total group inservices and more individual consultation and demonstrations in the centers by a nutrition specialist in early childhood nutrition education may be necessary to assist teachers with activities and increase enthusiasm among the parents.

FOOD SERVICE PERSONNEL IN-SERVICE TRAINING

The food service personnel in-service training consisted of five 2-hour sessions presented to two groups of food service personell. The first group of 12 persons took part in the in-service training during October and November, 1979; the second group of 13 persons received the training during January and February 1980. A test instrument was prepared, with items based on the proposed curriculum content. Pretests and post-tests were administered prior to the training and upon completion of the training for each group of personnel. The number of persons taking the pretest and post-test in each group is shown in Table 14.

Table 14.

Food Service Personnel taking Pre- and Post- Tests

	Number of Personnel Taking	
Group	Pretest	Post-test
A(Oct.-Nov. '79)	12	7
B(Jan.-Feb. '80)	12	13

Five of the persons taking the pretest did not take the post-test in Group a; one person in Group B took the post-test, but did not take the pretest.

A comparison of the pretest/post-test scores on each item on the pretest and post-test for each group of food service personnel is given in Tables and . For Group A, there was an increase in the percent of correct answers from the pretest to the post-test in 10 of the 20 items, 1 item showed no change (e.g. all marked it correct, on both the pretest and post-test), and 9 of the items had a decrease in the percent of correct answers. In group B, a similar pattern is present. Increases in the percentage of correct answers are present in 10 of the 20 items, 2 showed no change, and 8 had decreases.

The direction of the percent changes in Groups A and B was not consistent. Five items showed decreases for both, 4 showed an increase in A and a decrease in B, 3 showed a decrease in A and an increase in B, 2 showed no change in A and a decrease in B, and 1 showed an increase in A and no change in B.

Based on the pretest/post-test analysis of changes in the number of correct answers, it is unlikely that much, if any, curriculum-based learning took place during the in-service training. This is true, if the test instrument is consi-

dered to be a valid measure of the learning which should have taken place.

There are a number of possible explanations for the lack of a consistent increase in correct answers from pretest to post-test. The proposed in-service training component was to consist of "a 20 hour course". Instead the training consisted of a 10 hour course which was repeated to two different groups of food service personnel. Thus, the food service personnel received only one-half of the amount of training originally proposed. The items in the questionnaire, for the most part, focussed on factual data in regard to the nutritional characteristics and values of various foods. Apparently, too little time was alloted to that topic during the in-service training, or the instructional approach used to teach it was inadequate or inappropriate, or both.

Table 15

Group A. Pretest/Post-test Comparison of Correct Answers on Food Service Personnel "Food and Nutrition Quiz". October, November, 1979

	Pretest (N=12)			Post-test (N=7)			
Question	#Answering Question	#Correct	%Correct	#Answering Question	#Correct	%Correct	Change in % Correct
1	12	7	58.3	7	5	71.4	+13.1
2	12	9	75.0	7	7	100.0	+25.0
3	12	12	100.0	7	7	100.0	0.0
4	12	7	58.3	7	4	57.1	- 1.0
5	12	11	91.7	7	7	100.0	+ 8.3
6	12	3	25.0	7	1	14.2	-10.8
7	12	10	83.3	7	7	100.0	+16.7
8	12	5	41.7	6	3	50.0	- 8.3
9	12	5	41.7	7	5	71.4	+29.7
10	12	10	83.3	7	5	71.4	-11.9
11	12	11	91.7	6	6	100.0	+ 8.3
12	12	7	53.3	7	3	42.9	-10.4
13	12	10	83.3	7	6	85.7	+ 2.4
14	10	8	80.0	7	5	71.4	- 8.6
15	12	1	8.3	7	1	14.2	+ 5.9
16	11	6	54.5	7	6	85.7	+31.2
17	10	9	90.0	6	5	83.3	- 6.7
18	11	9	81.8	6	6	100.0	+18.2
19	12	11	91.7	7	6	85.7	- 5.8
20	12	11	91.7	6	5	83.3	- 8.4

Table 16

Group B. Pretest/Post-test Comparison of Correct Answers on Food Service Personnel "Food and Nutrition Quiz". October, November, 1979

	Pretest (N=12) (January)			Post-test (N=13) (February)			
Question	#Answering Question	#Correct	%Correct	#Answering Question	#Correct	%Correct	Change in % Correct
1	12	12	100.0	13	9	69.2	-30.8
2	12	10	83.3	13	12	92.3	+ 9.0
3	11	6	54.5	13	10	76.9	+22.4
4	12	6	50.0	13	6	46.2	- 3.8
5	12	12	100.0	13	13	100.0	0.0
6	12	4	33.3	13	3	25.0	- 8.3
7	12	10	83.3	13	12	92.3	+ 9.0
8	12	3	25.0	13	1	7.7	-17.3
9	11	7	63.6	12	8	66.7	+ 3.1
10	12	10	83.3	13	11	84.6	+ 1.3
11	12	10	83.3	12	10	83.3	0.0
12	11	3	27.3	13	3	23.1	- 4.2
13	12	11	91.7	13	10	76.9	-14.8
14	10	6	60.0	12	10	83.3	+23.3
15	12	4	33.3	13	2	15.4	-17.9
16	12	8	66.7	13	10	76.9	+10.2
17	12	9	75.0	13	9	69.2	- 5.8
18	11	8	72.7	12	11	91.7	+19.0
19	12	11	91.7	13	13	100.0	+ 8.3
20	11	9	81.8	13	13	100.0	+18.2

SPEAC FOR NUTRITION WORKSHOPS

In the period from March 17 to June 14, 1980, 11 SPEAC workshops were offered in 10 different communities throughout Minnesota. These workshops were arranged in cooperation with the Minnesota Regional Nutrition Education and Training (NET) Coordinator in each area. Participants included early childhood educators, parent educators, key parents, nutrition educators of preschool children, secondary child development educators, and vocational food and development educators. Each workshop was approximately 2 hours in duration.

The goals of the workshops were to facilitate a context wherein participants could: (1) examine a child's view of food; (2) observe nutrition information thru a filmstrip and information sharing; (3) experience snack planning and preparation; (4) become aware of activities to incorporate into their center and facilitate involvement with their staff, parents and children, and (5) learn how SPEAC is a part of nutrition for the preschool child. Each workship sonsisted of a number of different learning activities including a filmstrip on nutrition for the preschool child, a lecture on nutrition, folder handouts, and presentations on meal patterns and common nutritional problems, vegetarian diets snack preparation, activities the participants can do, and how SPEAC is a part of nutrition education for preschool children and their caregivers. Following the presentation of each workshop, the participants filled out Workshop Evaluation Forms. Information from these evaluation forms is show in Table 17.

Table 17.

Responses to Evaluation Questions

Question 1. "To what extent was the session value to you?"

Responses - All Workshops

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
105	59.3	65	36.7	6	3.4	1	0.6	177	100.0

Location of Workshop	Number of Respondents	Mean Response To Question 1.
All workshops	177	1.45
Rochester AVTI	23	1.70
Eveleth	9	1.33
Duluth	31	1.58
Brainerd	12	1.50
Fergus Falls	16	1.44
Marshall	13	1.23
Mankato (Voc. Ed.)	3	1.00
Thief River Falls	20	1.20
Mankato(NET and Early Childhood Association)	21	1.48
Bemidji	21	1.48
St. Paul/ Mpls.	8	1.38

Question 2. "To what extent did this session provide nutrition information on the preschool child?"

Responses - All Workshops

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
117	56.8	84	40.8	5	2.4	0	0.0	206	100.0

Location of Workshop	Number of Respondents	Mean Response To Question 2.
All workshops	206	1.46
Rochester AVTI	25	1.64
Eveleth	12	1.17
Duluth	39	1.46
Brainerd	14	1.43
Fergus Falls	18	1.50
Marshall	14	1.36
Mankato (Voc. Ed.)	5	1.40
Thief River Falls	21	1.38
Mankato (NET and Early Childhood Association)	25	1.44
Bemidji	24	1.54
St. Paul/ Mpls.	9	1.44

Question 3. "To what extent do you feel this session assists you in planning and serving appropriate well-balanced, nutritious and appealing meals and snacks to the preschool child?"

Responses - All Workshops

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
102	48.8	92	44.0	14	6.7	1	0.5	209	100.0

Location of Workshop	Number of Respondents	Mean Response To Question 3.
All workshops	209	1.59
Rochester AVTI	26	1.92
Eveleth	12	1.00
Duluth	39	1.56
Brainerd	15	1.53
Fergus Falls	17	1.65
Marshall	14	1.21
Mankato (Voc. Ed.)	5	1.20
Thief River Falls	21	1.38
Mankato (NET and Early Childhood Association)	25	1.84
Bemidji	24	1.83
St. Paul/ Mpls.	9	1.33

Question 4. "To what extent did this session provide awareness of nutrition education activities with the preschool child?"

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
108	54.5	79	39.9	10	5.1	1	0.5	198	100.0

Location of Workshop	Number of Respondents	Mean Response To Question 4
All workshops	198	1.52
Rochester AVTI	23	1.78
Eveleth	10	1.00
Duluth	37	1.51
Brainerd	12	1.58
Fergus Falls	18	1.56
Marshall	14	1.29
Mankato (Voc. Ed.)	5	1.40
Thief River Falls	21	1.33
Mankato (NET and Early Childhood Association)	25	1.64
Bemidji	24	1.71
St. Paul/ Mpls.	9	1.22

Question 5. "To what extent did this session provide you with information on the SPEAC For Nutrition program and teaching materials?"

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
134	66.7	57	28.4	3	1.5	7	3.5	201	100.1

Location of Workshop	Number of Respondents	Mean Responses to Question 5.
All workshops	201	1.38
Rochester AVTI	24	1.42
Eveleth	11	1.55
Duluth	37	1.43
Brainerd	15	1.73
Fergus Falls	18	1.28
Marshall	13	1.23
Mankato (Voc. Ed.)	5	1.00
Thief River Falls	21	1.19
Mankato (NET and Early Childhood Association)	25	1.36
Bemidji	24	1.58
St. Paul/ Mpls.	9	1.22

Question 6. "To what extent do you feel this session will assist you in promoting a cooperative staff-parent nutrition education program in your center?"

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
51	26.7	92	48.2	42	22.0	6	3.1	191	100.0

Location of Workshop	Number of Respondents	Mean Response to Question 6
All workshops	191	2.02
Rochester AVTI	22	2.45
Eveleth	10	1.80
Duluth	32	1.97
Brainerd	14	1.79
Fergus Falls	17	1.82
Marshall	13	1.62
Mankato (Voc. Ed.)	5	1.80
Thief River Falls	20	1.50
Mankato (NET and Early Childhood Association)	25	2.12
Bemidji	24	2.42
St. Paul/ Mpls.	9	2.00

Question 7. "To what extent do you feel the format of this session could have been improved?"

To a great extent 1		To some extent 2		To a slight extent 3		To no extent 4		Total	
#	%	#	%	#	%	#	%	#	%
0	0.0	10	5.8	77	44.5	86	49.7	173	100.0

Location of Workshop	Number of Respondents	Mean Response to Question 7
All workshops	173	3.44
Rochester AVTI	21	3.00
Eveletn	10	3.40
Duluth	30	3.40
Brainerd	12	3.50
Fergus Falls	15	3.53
Marshall	13	3.07
Mankato (Voc. Ed.)	4	4.00
Thief River Falls	14	3.71
Mankato (NET and Early Childhood Association)	25	3.44
Bemidji	21	3.43
St. Paul/ Mpls.	8	3.62

Overall, participants' responses to the workshops were highly positive. The highest mean rating (1.38 on a scale of 1 - 4) given by all respondents is on question 5, which deals with providing information on SPEAC For Nutrition program and teaching materials. The lowest mean rating (2.02 on a scale of 1 - 4) is to question 6 which covers the extent to which the workshop assisted them in promoting a cooperative staff-parent nutrition program in their center.* Although the responses to the evaluation questions are generally consistent, there is some variations from community to community. Rochester AVTI generally gives the lowest ratings (on 6 of the 7 questions), whereas Eveleth tended to give the highest ratings (on 3 of the 7 questions).

In addition to the fixed alternative questions already discussed, the evaluation form also included two open-end questions. Participants were asked, "what additional assistance do you need at this time?" The most frequently mentioned responses are given in Table 18.

Table 18. Additional Assistance Needed at This Time.

Most Frequently Mentioned Responses	Number of Times Mentioned
More information on snack ideas	1
More handout materials	5
More information on vitamins	4
More information on food additives	3
More recipes	3
More information on food quackery	3
More information on vegitarianism	3
More information on nutrition education activities and curriculum	3

*Question 7 has the lowest mean rating (3.44), but since the question is stated in the negative, the responses should be reverse weighted with a mean of 1.56 for comparison purposes.

Participants were asked what techniques and methods presented in the workshop they would use with their staff, parents, and students. The most frequently mentioned responses are presented in Table 19.

Table 19. Techniques and Methods That Particpants Will Use.

Most Frequently Mentioned Responses	Number of times Mentioned
The snack ideas	45
Involving children in food preparation	13
The handouts and resource books	9
The information on the relation between upbringing and later food attitudes	8
The filmstrips	6
Trying creative food and new variations	6
Information in food preparation	5
The format-name tags, discussion questions, sharing	3
The recipes	3

The techniques and methods in which the participants appear to be most interested in using are the snack ideas presented in the workshop and the ideas of involving children in food preparation.

RECOMMENDATIONS FOR FUTURE EVALUATIONS

The Child Care Food Program is designed to overcome the preconditions of the economically and culturally disadvantaged that interfere with exposure to the desireable effects of educational intervention and to help counterbalance whatever disinterest and neglect may exist in the homes of all children

Accordingly, findings in this study should be of use to CCFP funding agencies, public health nutritionists, health educators, dietitians, home economists, early childhood educators, child nutrition advocacy groups, social scientists and parents.

One rationale upon which nutrition education is based is the initial prevention of the childhood development of poor eating habits which increase the probability of developing nutritional risk. This, coupled with tne assumption that nutrition education for preschool children is already proven, can build upon educational delivery approacnes suggested in the research literature, if ways can be found to facilitate such delivery and overcome barriers to educational efforts such as this.

Of course, as with any new endeavor, there should be continued refinement, reinforcement and/or follow-up assessments to measure persistent or diminishing effects over time.

Certainly, benefits-costs should be calculated to determine the worth of results obtained vs. effort expended.

A more rigorous type of evaluation could conduct nutrient analyses of selected menus before and after training to determine differences in treatment and comparison sites, recalling that in the present study many participants asserted that menus were already of high quality prior to implementing the Project.

Since teachers reported being too overburdened to take on the task of presenting nutrition education enthusiastically, this major barrier to program implementation in day care settings could be overcome with the availability of a nutrition education specialist for support and quality control purposes

Finally, if the goal of projects such as SPEAC is to assert an established place in regular school activities and not just an occasional adjunct activity, tnen the need for a CCFP nutrition specialist is imperative. The size and scope of the curriculum developed clearly is too imposing for most teachers with little or no training in nutrition education.

Even though testing and developing the curriculum may have involved more time and effort than employing the fully developed model, a specialist visiting a child care center as infrequently as one morning a week could assure a regular, continuous program of level quality, regardless of frequent directorial, teacher and child turnover.